

WHAT IS CLAIMED IS:

1. A method for compressing digital images upon capture at a digital camera device, the method comprising:

5 receiving user input requesting capture of a sequence of digital images at the digital camera device, said digital images being stored in an image buffer;

10 applying a relatively-fast compression technique to temporarily compress at least some of the digital images upon capture, so as to increase availability of storage in said image buffer for storing other digital images being captured;

15 at some point in time after cessation of the user input, decompressing any of the digital images that were temporarily compressed; and thereafter

20 applying a relatively-thorough compression technique to the captured sequence of digital images.

15 2. The method of claim 1, wherein said relatively-fast compression technique requires fewer processing resources for completion than said relatively-thorough compression technique.

20 3. The method of claim 1, wherein said digital camera device supports multithreaded execution and wherein said step of applying a relatively-thorough compression technique occurs as a background execution thread.

25 4. The method of claim 3, wherein said background execution thread comprises a low-priority thread that is executed by a microprocessor of the digital camera device.

5. The method of claim 1, wherein said sequence of digital images comprises successive pictures rapidly captured at the digital camera device.

6. The method of claim 5, wherein the digital images of the sequence are captured within a few seconds time.

5 7. The method of claim 1, further comprising:
 after the digital images have been compressed using the relatively-thorough compression technique, storing the compressed digital images on media.

10 8. The method of claim 1, further comprising:
 after the digital images have been compressed using the relatively-thorough compression technique, transferring the compressed digital images to another device.

15 9. The method of claim 8, wherein the compressed images are transferred using wireless communication.

20 10. The method of claim 8, wherein the compressed images are transferred using wireline communication.

25 11. The method of claim 1, wherein said digital camera device supports multithreaded execution and wherein said step of applying a relatively-fast compression technique occurs as a higher-priority thread.

12. The method of claim 1, wherein the relatively-thorough compression technique produces a smaller-sized compressed image file for a given digital image than that produced by the relatively-fast compression technique.

25 13. The method of claim 1, wherein the relatively-fast compression technique requires less compression time when compressing a given digital image than that required by the relatively-thorough compression technique.

14. The method of claim 1, further comprising:
after a given digital image is temporarily compressed, storing a compressed
file of that digital image in a flash memory.

5 15. The method of claim 1, further comprising:
after a given digital image is temporarily compressed, storing a compressed
file of that digital image in a RAM buffer.

10 16. The method of claim 1, further comprising:
after a given digital image is temporarily compressed, storing a compressed
file of that digital image back in the image buffer.

15 17. The method of claim 1, further comprising:
after a given digital image is temporarily compressed, deleting the given
digital image's original copy from the image buffer.

20 18. The method of claim 1, further comprising:
after a given digital image is temporarily compressed, performing substeps of:
 (1) storing a compressed file of that digital image in a RAM buffer,
and
 (2) transferring the compressed file from the RAM buffer to flash
memory.

25 19. The method of claim 18, wherein said transfer step occurs when the RAM
buffer is nearly exhausted.

20. The method of claim 18, wherein said transfer step occurs when the user
is no longer requesting capture of a sequence of digital images.

21. The method of claim 1, wherein latency of the digital camera device is decreased between capturing successive images when the relatively-fast compression technique is employed, as compared to employing the relatively-thorough compression technique.

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22. The method of claim 1, further comprising:
capturing each digital image as a luminosity record; and
applying pre-compression to each luminosity record, in preparation for compression.

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23. The method of claim 22, wherein said pre-compression comprises selected ones of noise smoothing and de-mosaic.

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24. The method of claim 1, wherein said step of applying a relatively-thorough compression technique occurs once the digital camera device has processed all high-priority tasks.

25. The method of claim 1, wherein said relatively-fast compression technique includes discrete wavelet transformation.

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26. The method of claim 1, wherein said relatively-fast compression technique includes quantization.

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27. The method of claim 1, wherein said relatively-fast compression technique includes low-complexity entropy encoding.

28. The method of claim 27, wherein said low-complexity entropy encoding includes run-length encoding.

29. The method of claim 1, further comprising:
deferring applying said relatively-thorough compression technique to the
digital images during periods of time when the user is providing additional input.

5 30. The method of claim 29, wherein said additional input comprises user
input other than that for requesting capture of additional images.

31. The method of claim 29, wherein said additional input comprises user
input for configuring the digital camera device.

10 32. The method of claim 1, wherein said step of decompressing any of the
compressed digital images that were temporarily compressed restores the digital images to
their approximate pre-compression state.

15 33. The method of claim 1, wherein said relatively-fast compression
technique includes lossy compression technique.

34. The method of claim 1, wherein said relatively-thorough compression
technique includes lossy compression technique.

20 35. The method of claim 1, wherein said relatively-thorough compression
technique includes high-complexity entropy encoding.

25 36. The method of claim 1, wherein each digital image is divisible into
separate bit planes and wherein said relatively-fast compression technique includes:
applying compression to individual bit planes of a given digital image
undergoing compression.

37. The method of claim 36, wherein said decompressing step includes:

decompressing an individual bit plane of a given digital image before decompressing other bit planes of that given digital image.

38. The method of claim 1, wherein said relatively-fast compression
5 technique provides about 1:4 compression.

39. The method of claim 1, wherein said relatively-thorough compression technique provides approximately 1:20 compression.

10 40. The method of claim 1, further comprising:
transmitting the compressed digital images wirelessly for remote processing to
a JPEG-compatible format.

15 41. A digital camera device with improved latency time between acquiring pictures, the device comprising:

a digital camera device for capturing digital images to an image buffer;
a user-activated button, integrated into the digital camera device, for generating a user request to capture a sequence of digital images at the digital camera device, said digital images being stored in the image buffer upon capture;

20 a first compression module, embodied within the digital camera device, for temporarily compressing at least some of the digital images upon capture, thereby freeing up available storage in said image buffer;

a decompression module, embodied within the digital camera device, for decompressing any of the digital images that were temporarily compressed at some point in time after activation of said user-activated button; and

25 a second compression module, embodied within the digital camera device, for compressing said digital images more thoroughly than that provided by said first compression module.

42. The device of claim 41, wherein said first compression module employs a relatively-fast compression technique that requires fewer processing resources for completion than said relatively-thorough compression technique.

5 43. The device of claim 41, wherein said digital camera device supports multithreaded execution and wherein said first compression module employs a compression technique that operates as a background execution thread.

10 44. The device of claim 43, wherein said background execution thread comprises a low-priority thread that is executed by a microprocessor of the digital camera device.

15 45. The device of claim 41, wherein said sequence of digital images comprises successive pictures rapidly captured at the digital camera device.

20 46. The device of claim 45, wherein the digital images of the sequence are captured within a few seconds time.

25 47. The device of claim 41, wherein the digital images that have been compressed using the second compression module are stored on a media device.

25 48. The device of claim 41, further comprising:
 a communication means for transferring the compressed digital images to another device.

25 49. The device of claim 48, wherein the compressed images are transferred using wireless communication.

50. The device of claim 48, wherein the compressed images are transferred

using wireline communication.

51 . The device of claim 41, further comprising:
a flash memory for storing a given digital image that has been temporarily
compressed.

52. The device of claim 41, further comprising:
a RAM buffer for storing a given digital image that has been temporarily
compressed.